

**Claims**

1. A water-soluble rolling oil composition for use in cold steel rolling applications comprising 15 to 70 % by weight of a partial polyol ester having a hydroxyl value of between 20 and 50 mg KOH/g and a level of polyunsaturation of between 0.01 to 8% by weight.
2. A water-soluble rolling oil as claimed in claim 1 wherein the partial polyol ester is derived from the reaction of at least one polyhydric alcohol with at least one monocarboxylic acid.
3. A water-soluble rolling oil as claimed in claim 2 wherein the polyhydric alcohol is chosen from neopentyl glycol, trimethylolpropane and pentaerythritol.
4. A water-soluble rolling oil as claimed in either of claims 2 or 3 wherein the at least one monocarboxylic acid is one or more polyunsaturated monocarboxylic acids or a mixture of polyunsaturated and non-polyunsaturated monocarboxylic acids.
5. A water-soluble rolling oil as claimed in any of claims 2 to 4 wherein the at least one monocarboxylic acid has 8 to 24, preferably 10 to 20 carbon atoms.
6. A water-soluble rolling oil as claimed in claim 4 wherein the polyunsaturated monocarboxylic acid is derived from coconut oil, topped coconut oil, palm kernel oil and mixtures thereof.
7. A water-soluble rolling oil as claimed in any of claims 4 to 6 wherein the non-polyunsaturated monocarboxylic acid is chosen from capric acid, lauric acid, myristic acid, palmitic acid, stearic acid, isostearic acid, hydrogenated C18 monomeric acid, arachidic acid, behenic acid and lignoceric acid and mixtures thereof.
8. A water-soluble rolling oil as claimed in claim 1 wherein the partial polyol ester is derived from the reaction of trimethylolpropane with a mixture of coconut oil or topped coconut and hydrogenated C18 monomeric acid.

9. A water-soluble rolling oil as claimed in claim 9 wherein the blend ratio of coconut oil or topped coconut oil to hydrogenated C18 monomeric acid in the partial polyol ester ranges from 80 to 20 weight percent to 20 to 80 weight percent, preferably from 60 to 40 weight percent to 40 to 60 weight percent.
- 5 10. A water-soluble rolling oil as claimed in any one of claims 1 to 9 wherein the partial polyol ester is present at levels between 20 to 50%, preferably 20 to 40% in the water-soluble rolling oil composition.
- 10 11. A water-soluble rolling oil as claimed in any one of claims 1 to 10 wherein the partial polyol ester has a hydroxyl value of between 25 and 40mg KOH/g.
12. A water-soluble rolling oil as claimed in any one of claims 1 to 11 wherein the partial polyol ester has a level of polyunsaturation between 0.1 to 5% by weight, preferably between 0.1 to 3% by weight.
- 15 13. A water-soluble rolling oil composition as claimed in any one of claims 1 to 12 further comprising other esters in the form of natural oils/fats and mineral oil.
- 20 14. A water-soluble rolling oil composition as claimed in any one of claims 1 to 13 further comprising a range of additives including antioxidants, antiwear/extreme pressure additives and emulsifiers
- 25 15. A water-soluble rolling oil composition comprising 20 to 70% by weight partial polyol ester, 0 to 20% by weight other esters in the form of natural oils/fats, 20 to 50% by weight mineral oil, 0.5 to 1% by weight antioxidant, 2 to 5% by weight of at least one antiwear/extreme pressure additive and 5 to 7% by weight of at least one emulsifier.
- 30 16. Use of a water-soluble rolling oil composition which comprises 15 to 70 % by weight of a partial polyol ester having a hydroxyl value of between 20 and 50 mg KOH/g and a level of polyunsaturation of between 0.01 to 8% by weight in cold steel rolling applications.
- 35 17. An oil in water emulsion comprising water and from 1 to 4% by weight of a water-soluble rolling oil composition which comprises 15 to 70 % by weight of a partial polyol ester having a hydroxyl value of between 20 and 50 mg KOH/g and

a level of polyunsaturation of between 0.01 to 8% by weight in cold steel rolling applications.

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